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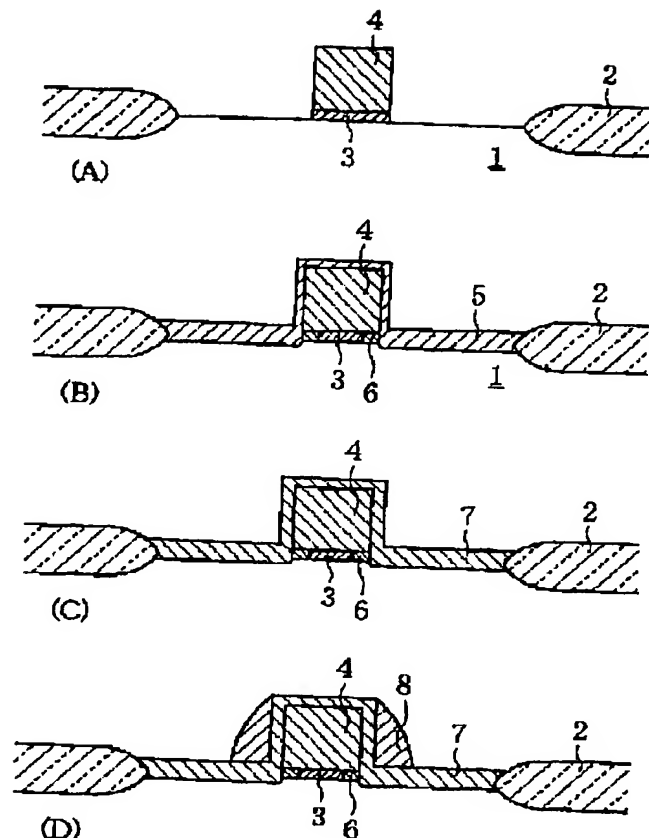
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TITLE : MOS SEMICONDUCTOR DEVICE AND
MANUFACTURE THEREOF



ABSTRACT : PURPOSE: To improve the deterioration resistance of hot carrier and dielectric breakdown of a gate insulating film by a method wherein a gate insulating film, consisting of a silicon oxide film, is formed under the center part of a gate electrode, and the gate insulating film, consisting of a silicon nitride film or a silicon oxynitride film, is formed under the circumferential part of the gate electrode.

CONSTITUTION: A gate insulating film 3 is formed by thermally oxidizing the surface of a silicon substrate 1, a polysilicon layer is formed thereon, and gate electrodes 3 and 4 are formed by patterning. Then, a silicon nitride film 5 is formed on the surface of the gate electrode 4 and the silicon substrate by heating them in ammonia gas, and the gate insulating film 3 is converted to a silicon nitride film 6. Also, it is converted to a silicon oxynitride film 7 by heating it in oxygen gas. Then, a silicon oxide film is deposited on the silicon substrate 1, and a side wall 8 is formed by conducting anisotropic etching. Also, impurity ions are implanted after formation of the silicon oxynitride film 7 and the side wall 8.

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